

**Before the**  
**FEDERAL COMMUNICATIONS COMMISSION**  
**Washington, DC**

<b>In the matter of</b>	)	
	)	
<b>Inquiry Regarding Carrier</b>	)	<b>ET Docket 03-104</b>
<b>Current Systems, Including</b>	)	
<b>Power Line Broadband Systems</b>	)	

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**Written Comments of Gary C. Sutcliffe**

I wish to comment on the interference potential of broadband transmissions over power lines (BPL).

As a matter of background, I have been employed in the electronics industry for over 30 years and hold a bachelor's degree in electrical engineering. I have also been a licensed Amateur Radio operator for over 30 years, currently holding an Amateur Extra class license with the call sign W9XT.

In my professional work I have developed a number of products that fall under Part 15 regulations and required testing and certification. In my Amateur Radio work, I have experienced interference from Part 15 devices. In short, I have experience on both sides of the interference issue.

Although my comments are aimed primarily to potential interference to Amateur Radio operations in the HF and lower VHF frequencies, they also apply to military, commercial, radio astronomy, and other users of these frequencies.

My main concerns regarding potential interference are as follows:

- (1) Broad band nature of BPL
- (2) Non-point source nature of BPL
- (3) Potential for long range propagation of BPL interference

### **Broad band nature of BPL**

With digital Part 15 devices, interfering signals tend to occur at discrete frequencies. At the low power and low signal strength frequently encountered in radio communications, these interfering signals can be much stronger than the desired radio signal. In the Amateur Radio service, it is usually possible to work around strong interfering signals from digital devices. This can be done by changing frequency by a few KHz or special filtering techniques that work against narrow bandwidth signals.

BPL on the other hand will not occupy a few discrete frequencies. BPL has the potential to make tens of MHz of HF spectrum unusable if it is not implemented properly.

### **Non-point source nature of BPL**

Most Part 15 devices are relatively small, and interference caused by them are localized in nature. BPL will utilize existing power lines, which cover a large area. These power lines will act as antennas, radiating over entire neighborhoods.

The FCC requires that manuals for Part 15 devices contain a statement regarding potential interference. Some of the suggestions for reducing any interference than may occur include relocating or reorienting the device or turning it off. Surely reorienting power lines is not a practical solution!

The effective size of the power lines acting as antennas will also make it difficult to use standard direction finding (DF) techniques in tracking down sources of BPL generated interference.

### **Potential for long range propagation of BPL interference**

In my Amateur Radio operations, I have used transmitters with an output power significantly under one watt. Under the right conditions I have made contacts with similarly equipped stations hundreds or thousands of miles away. Sometimes the signal strengths are amazingly strong. This shows the long range interference potential of even low power emissions in the HF radio spectrum.

A given location may have radio propagation to very large regions. The cumulative effect of a national installation of BPL systems could raise the noise floor to unacceptable

levels, even if the local BPL systems do not themselves cause interference. It will be extremely difficult to pre-test for this problem because it will not show itself until large numbers of BPL systems are installed. By then it will be too late.

### **The Need to Protect Amateur Radio Frequencies**

Since 9/11, government bodies at all levels have been spending billions of dollars to improve the security of the nation to terrorist attacks, and to improve the ability to respond in the case of such an attack. As a member of the Amateur Radio Emergency Service (ARES) for Washington County Wisconsin, I have been involved with Amateur Radio in public service and emergency communications planning.

Amateur Radio has a long history of service in times of emergency, both natural and man made. Large amounts of radio equipment and thousands of experienced radio operators are available to the nation in an emergency at no cost to the taxpayer. It would be tragic if this resource is reduced because of direct interference during an emergency or loss of interest in Amateur Radio because of continuous interference from a BPL system.

There are currently alternatives to BPL including cable and DSL. Newer technologies such as fiber optics and spread spectrum systems in the GHz range will provide future alternatives. There are no alternatives to the unique advantages of HF radio communications and Amateur Radio. These must be protected in any implementation of BPL.

### **Summary**

BPL must be implemented with regulations and maximum emission levels set in a manner that will not cause interference to Amateur Radio and other users of the HF radio spectrum. It may be necessary to prevent BPL operation in Amateur Radio and other sensitive frequency bands.

Current Part 15 emission limits are a reasonable compromise between economical production of digital and other devices and limiting severe radio interference. Because of the broad band nature and other characteristics of BPL, I believe the maximum emission levels currently allowed for digital and other Part 15 devices will prove to be much too high in a BPL system to avoid widespread interference to Amateur Radio and other HF users. Lower emission standards are needed for BPL than for other Part 15 devices.

Finally, BPL must not be implemented until exhaustive testing has proved that it will not cause harmful interference, and that regulations and procedures for dealing with interference are implemented.

**Respectfully submitted,**

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